What is claimed is:

1. A voltage controlled oscillator, comprising:

a resonant section that oscillates an alternating-current signal, said resonant section comprising:

a pair of output terminals;

an inductor connected between said pair of output terminals;

a variable capacitor parallelly connected to said inductor;

a pair of capacitors, where one electrode of each capacitor is severally connected to said pair of output terminals;

a pair of first switches, where each switch is severally provided between the other electrode of the pair of capacitors and a reference electrode; and

a second switch provided between the other electrodes of said pair of capacitors; and

a negative resistance section that is provided between said resonant section and a power source and supplies an electric current to said resonant section synchronously with said alternating-current signal.

2. The voltage controlled oscillator according to Claim 1, wherein said first and second switches are a type of transistor selected from a group that consists of NMOS transistors, PMOS transistors and CMOS transistors.

3. The voltage controlled oscillator according to Claim 1, wherein said variable capacitor is varactor device to which a control voltage is input and whose capacitance

varies according to the control voltage.

4. The voltage controlled oscillator according to Claim 1, wherein said inductor is a spiral inductor formed on a substrate.

5. The voltage controlled oscillator according to Claim 1, wherein said power source has high potential wiring and low potential wiring, said pair of output terminals essentially consists of a first output terminal and a second output terminal, and said negative resistance section comprises:

a first section, said first section has:

a first P-channel transistor, in which one of source/drain is connected to said high potential wiring, the other one is connected to said first output terminal, and a gate is connected to said second output terminal; and

a second P-channel transistor, in which one of source/drain is connected to said high potential wiring, the other one is connected to said second output terminal, and a gate is connected to said first output terminal; and

a second section, said second section has:

a first N-channel transistor, in which one of source/drain is connected to said low potential wiring, the other one is connected to said first output terminal, and a gate is connected to said second output terminal; and

a second N-channel transistor, in which one of

source/drain is connected to said low potential wiring, the other one is connected to said second output terminal, and a gate is connected to said first output terminal.

6. The voltage controlled oscillator according to Claim 1, wherein said oscillator is the local oscillator of a phase locked loop circuit.